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Teachers' Ratings of the Academic Performance of Children with Epilepsy

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Abstract

The present study examined how knowledge of children's seizure condition was related to teachers' assessment of the children's academic ability. Children with epilepsy were divided into two groups based on teacher awareness of the child's seizure condition (Label). The children's achievement was assessed using the Woodcock Johnson Tests of Achievement-Revised (WJ-R), and the teacher's ratings were obtained from the Child Behavior Checklist Teacher Report Form (TRF) (Source). A 2 (Source) $\times$ 2 (Label) mixed-design analysis of covariance (controlling for IQ and how well the teacher knew the child) found a significant interaction, $F(1, 121) = 4.22, p = 0.04$. For the WJ-R there was no effect of Label on Achievement, but on the TRF lower scores were observed for children who were labeled. These results support the hypothesis that some teachers might underestimate the academic abilities of children with epilepsy.

Keywords

Seizures; Cognition; Child; School; Achievement

1. Introduction

Children who have a disease or disability can be at a potential disadvantage in the classroom depending on the perceptions associated with the "labels" of their illnesses. Teachers might have a predetermined idea regarding the performance of labeled children, attributed to the perception the teachers hold in how children with a disease or disability differ from the societal norm [1,2]. Labeling might affect not only a teachers' perception of the students but also the perceptions that the children have of themselves. Children who are labeled could feel they are

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devalued or discriminated against, feel threatened when interacting with others, or feel they must avoid social situations in which they could potentially be rejected. These children might feel the need to keep their condition a secret, hide it from others, and avoid situations in which the condition would be addressed [3]. Thus, epilepsy, like many other conditions, can carry a set of perceptions that follows children throughout their lives, particularly in the classroom in which teachers often have access to children's health and education records.

Many studies have examined teachers' perceptions of epilepsy, with similar results found all over the world. Results from Thailand [4], Croatia [5], and the United States [6,7] have documented that many teachers are informed about general principles about epilepsy but that some might have some misperceptions based on incomplete or outdated information. Also, teachers might generalize from global statistics of psychopathology and academic abilities in children with epilepsy to develop assumptions and predispositions toward individual students. It is conceivable, therefore, that teachers might underestimate the ability of children with epilepsy to perform in the classroom.

The present study examined how the label of having epilepsy or seizures is related to teachers' ratings of children's academic performance compared to the children's actual performance on a standardized measure of academic achievement. The independent variable was dichotomous (whether or not the teachers knew about the children's seizure condition). In addition, a second independent variable was the source of academic achievement data (teachers ratings vs. the children's test scores). The dependent variable was academic achievement scores, assessed through the two sources: teachers' report of the children's progress in school (teachers' source of academic evaluation) and the child's score on a standardized achievement test (child's source of academic evaluation). Using a 2×2 (Label $\times$ Source of Achievement) design, it was hypothesized that teachers would rate children who were known to have epilepsy lower on achievement than children who were not known to have epilepsy, regardless of their objective achievement (i.e., main effect for Label). Variables that could potentially affect these relationships (e.g., IQ, how well the teacher knows the child) were also explored as possible covariates.

2. Method

2.1. Participants and Setting

Participants were identified and recruited from pediatric neurology practices, private pediatric neurology clinics, and school nurses throughout the state of Indiana and neighboring areas as part of a broader study of neuropsychological functioning and child adaptation to epilepsy [8]. In order to be included in the analysis, children were required to have had a diagnosis of epilepsy for at least 6 months. Children were excluded for a history of any other chronic physical condition(s), diagnosis of mental retardation, or classification by the schools as being mentally handicapped. After initial examination of the data, children were excluded from the analysis if they did not have complete data. Finally, children were excluded if their teacher did not know them for at least three months. In total, 125 children with epilepsy were included in the final analysis. Demographic, clinical, and academic characteristics are reported in Table 1.

The sample was divided into two separate groups, one group whose teachers were aware of the child's epilepsy (Labeled, $n = 92$) and one group whose teachers did not know about their epilepsy (Unlabeled, $n = 33$). Demographic, clinical, and academic characteristics are reported for each of these two groups in Table 1. An independent samples t -test was used to compare the two groups on demographic, seizure, and teacher variables. It was found that the groups significantly differed on general intelligence score, $t(123) = 2.28, p < 0.05$, with the Labeled Group scoring 6.7 IQ points lower than the Unlabeled Group. The groups also differed on how

well the teachers knew the children, $t(66.94) = -2.04, p < 0.05$; teachers of the Labeled Group reported knowing them better than teachers of the Unlabeled Group

2.2. Measures

2.2.1. Participant Variables—Demographic information was collected by parent report and included date of birth, grade, ethnicity, handedness, and sex. Additionally, parents were asked about the number of educational services their child received, answering yes or no to whether or not their child attended special education classes, resource room, tutoring, speech therapy, occupational therapy, physical therapy and whether or not their child received extra time on tests or assistance with reading tests. Parents also were asked whether or not their child had ever been diagnosed with a learning disability.

For characterizing the sample, IQ was estimated by the Kaufman Brief Intelligence Test (K-BIT), an individually administered screening instrument for intelligence that correlates highly with full-length IQ tests [9]. For the purposes of this research study, only this screening tool was used, precluding more precise descriptions regarding IQ in this sample.

Seizure variables were also collected for each child, including age of onset, seizure type, epileptic syndrome, medications, and seizure control. Epileptic syndrome was classified for each child by a neurologist (author D.W.D.) and is reported in Table 1. This study excluded children with an IQ less than 70; therefore, some epileptic syndromes are not represented. Current seizure control (either controlled, active, or unknown) was determined by whether or not the child experienced a seizure in the past year. Antiepileptic medications were reported by parents. Due to the diversity of antiepileptic medications and potential polytherapy combinations, as well as the limited sample size of the study, only monotherapy and polytherapy were compared. Additionally, time of the day in which medications were usually taken was not reported; therefore, we were unable to compare groups on dose timing.

2.2.2. Teacher Variables—As part of the TRF, teachers provided information on the number of special education services the child received, the amount of time the teacher was spending with the child, how *long* the teacher had known the child, and how *well* the teacher knew the child. To determine special services, teachers were asked the following questions:

- a. “Has he/she ever been referred for special class placement, services, or tutoring?”
- b. “How much time does he/she spend in your class or service per week?” (and number of hours per day in the class)
- c. “For how many months have you known this pupil?”
- d. “How well do you know him/her?” (“Not well, Moderately well, or Very well”).

Due to the nature of this measure, information regarding characteristics of teachers (e.g., teacher age, number of years teaching, work experience) was not collected.

2.2.3. Independent Variables

2.2.3.1. Label The label of having seizures or epilepsy was determined by teacher report of knowledge that the child has a medical condition. This was the between-subjects variable. Specifically, on the TRF, the teacher must answer the question “Does this pupil have any illness or disability (either physical or mental)?” Then the teacher is asked to write in the condition (s) of which they are aware. Teachers who answered the question with the words “seizures” or “epilepsy” were considered as knowing that the child had seizures, and that child was placed into the Labeled Group. If the teacher did not answer either “seizures” or “epilepsy” to the question, then the child was placed into the Unlabeled Group because it is assumed that the teacher did not know about the condition. Because many parents were concerned about teachers

finding out that their child had seizures, parents were assured by study coordinators that study personnel would keep their child's condition confidential, thereby precluding systematic inquiry into how the teachers learned of the child's epilepsy.

2.2.4. Source of Achievement—Two sources of achievement were obtained for each child. Each child was given an individually administered standardized measure of academic achievement as part of a larger neuropsychological battery. The second source of academic achievement was a report from the child's teacher. This was the within-subjects variable with two levels (described further as dependent variables).

2.3. Dependent Variables

2.3.1. Child's Objective Academic Achievement—Six subtests of the Woodcock-Johnson Revised Tests of Achievement (WJ-R) [10] were used as the child's source of academic achievement: Letter-Word Identification, Passage Comprehension, Calculation, Dictation, Writing Samples, and Applied Problems. From these six subtests, three broad indices were calculated: Broad Reading Index (Letter-Word Identification and Passage Comprehension), Broad Mathematics Index (Calculations and Applied Problems), and Written Language Index (Dictation and Writing Samples). Each of these broad scores takes into account a basic skills portion of the subject as well as a conceptual reasoning level of that subject domain. Standard scores for age were computed for each subtest and broad index [10]. The mean of the three achievement broad index scores was used as the child's source of academic achievement

2.3.2. Teacher's Academic Ratings—The Teacher Report Form (TRF) of Achenbach's Child Behavior Checklist (TRF) was completed by teachers for each child who participated in the study [11]. This is a standardized behavior rating scale that has good reliability and validity and was normed on a sample of 2,368 on-handicapped children, ages 4-18. This scale has also been seen to have an internal consistency of $\alpha = 0.67$ when examining teacher report of the child's achievement. Within the TRF teachers rate the child's overall academic performance and specific subject areas on a scale from 1 to 5 ("Far Below" to "Far Above" grade performance). Each subject score is based on a question regarding academic performance in that area and can be transformed into the Academic Performance T-score of the ratings. This T-score was used as the teachers' source of academic evaluation, (i.e., one level of the within-subject variable, Source of Achievement).

2.4. Procedure

Before the neuropsychological testing, families completed consent forms and demographic forms, including a release to contact the child's teacher for the TRF data. Prior to data collection, parents gave informed consent for their participation, and children gave informed assent. Participants were compensated for their involvement in the study. The Institutional Review Board of Indiana University Purdue University Indianapolis (IUPUI) approved the entire project.

Both children and parents completed a structured interview by phone, but children came to the medical center to complete a comprehensive neuropsychological battery, including the WJ-R and K-BIT. Neuropsychological testing was administered individually by psychometrists who were trained and supervised by a licensed neuropsychologist. Additionally, each child's EEGs, neuroimaging reports, and clinic notes were reviewed by a board certified neurologist (author D.W.D.) to determine seizure type. Teachers were sent the TRF in the mail and returned it to the researchers when it was complete.

3. Results

A 2 (Source) $\times$ 2 (Label) mixed-design analysis of covariance (ANCOVA) was conducted with Source of Achievement (WJ-R vs. TRF) as the within-subjects variable and Label as the between-subjects variable. All variables used in the analysis were converted to z-scores (standardized within the entire sample) to convert all scores to an equivalent metric, as the WJ-R scale differs from the TRF scale. Because the groups differed on IQ and on how well the teachers knew the children, these variables were statistically controlled as covariates. After controlling for these variables, there was a significant Source $\times$ Label interaction, $F(1, 121) = 4.22$, $p = 0.04$, which is depicted in Figure 1. Post hoc oneway ANCOVAs (controlling for IQ and how well the teacher knew the child) clarified the nature of the interaction. On the WJ-R, the difference between labeled and unlabeled groups was negligible (effect size, $d = -0.06$); on the TRF, by contrast, the difference was moderate in magnitude ($d = 0.35$). Adjusted scores, which account for the influences of the covariates, are reported at the bottom of Table 1.

4. Discussion

4.1 Summary

The label of epilepsy can carry many negative perceptions, which can affect the way that teachers rate these children on academic performance. In the present study, 125 children with epilepsy were examined on objective (standardized tests; WJ-R) and subjective (teacher ratings; TRF) measures of achievement. Even though Labeled and Unlabeled groups were equal (after adjusting for covariates) on objective, standardized achievement tests, teachers rated achievement lower in the Labeled group compared to the Unlabeled group.

4.2 Significance

The finding from the present study has implications for physicians, psychologists, educators, as well as for children with epilepsy and their parents. The results found here support the notion that teacher perceptions, beliefs, and their expectations of epilepsy could affect how they perceive and rate the performances and expectations of these children [1]. The perceptions that teachers hold, both negative and positive, might affect children's self-concept and perceptions of their own academic ability [12-15]. If teachers perceive children as performing poorly in school based solely on the label of epilepsy, they might be placing these children at a disadvantage for receiving the best possible education and support.

These findings are particularly important in light of the classic study by Rosenthal and Jacobson [16] on self-fulfilling prophecy. In that study, a randomly selected subgroup of children were labeled as having potential for great intellectual improvement while the rest of the children were not labeled as such. On subsequent objective IQ tests, these students improved more than the remaining children in the class, who were not labeled as having potential "strong intellectual growth." It was concluded that based upon the teacher's expectations and attention, these children improved academically, when they might not have without specific teacher attention [16]. Additionally, it has been found that teachers praise high-expectation students more often than they do low-expectation students [14], they tend to allow high-expectation children more time to answer a question than low-expectation students, and give more cues and pay closer attention to high-expectation students when compared to the low-expectation students [16].

These findings from the literature are problematic for the self-concept formation in children; labeled children might internalize a self-fulfilling prophecy [14-15]. It can be hypothesized that in response to their teacher's expectations, children develop a false belief in their abilities and perform to the standard set by the teacher, rather than performing to their actual abilities.

Therefore, when teachers believe a child will perform poorly, it is possible that the child actually will perform poorly [12,15,16].

The present findings create a quandary for professionals who want to equip teachers in the classroom. We want teachers to be aware that, in fact, a considerable proportion of children will present with learning disability (up to 50%) [17], attention-deficit/hyperactivity disorder or “ADHD” (approximately 38%) [18], and behavior problems [19]. Yet, many children with epilepsy do not have problems at school [17-18]. These messages must be delivered together. While some children with epilepsy might have difficulty in the classroom, this does not generalize to all children diagnosed. Therefore, it is important for teachers to enter the situation with an informed view of the academic and behavioral difficulties that might affect children diagnosed with epilepsy. In response to possible perceptions, it is important to educate teachers and school psychologists regarding epilepsy in children and the variability and diversity of seizure types and outcomes. Previous work educating patients and families [20] has found significant improvement in patient knowledge and family dynamics. In addition, it has been found that a neuropsychological report increases access to educational services for children with epilepsy in need of educational interventions [21]. School nurses also serve a valuable role in assisting in epilepsy education, possibly by providing in-service sessions for teachers or as a formal part of teacher orientation. Interventions modeled after those already in place for individuals and families need to be developed to assist with teacher and school psychologist education.

The findings of the current study raise a predicament for parents of children with epilepsy. On one hand, the parents might want to tell the school about their child’s epilepsy so that if the child has a seizure at school it can be dealt with appropriately. Also, parents might need to tell school administrators so that their child can take the necessary antiepileptic medications at school. In addition, it is unclear how teachers knew about the child’s diagnosis. Parents might have alerted the teachers as to their child’s condition, or it might be necessary for the child to take antiepileptic medications at school. Additionally, a teacher might have witnessed a seizure or have been alerted by a previous teacher or school nurse as to the child’s seizure status. Therefore, the necessity of a teacher knowing about a child’s seizure condition further complicates the situation. Yet, on the other hand, once the school is aware of the child’s epilepsy, the teacher is likely to find out about the label and possibly lower expectations for the child, which could possibly lower the child’s performance, as seen in the literature. Teacher education about seizures and epilepsy is the only way to prevent lowered expectations for the student and allow for the student to receive the best possible educational experience.

4.3. Limitations

There are several methodological limitations to the current study. When assessing a child’s achievement, the teacher might have taken variables other than academic achievement into consideration, such as work ethic, behavior problems, and attention during class, which might have influenced the results. Additionally, the teacher rating the child is asked to compare the child to other children in the class, not to national norms. Similarly, the scale used to measure how well the teacher knew the child is not ideal; in future studies, this should be assessed with a larger range of values. Similarly, it would be useful in future studies to collect information regarding characteristics of the teachers (e.g., experience, training) and regarding how they learned about the child’s seizure condition.

4.4. Future Research

Future research in this area should address a number of methodological issues, as well as replicating and extending the current study. To begin, teacher report of how well he/she knows the child should be measured with a greater range of values. In addition, teacher experience

should be measured. Also, when the teacher is asked to assess the child's achievement relative to other children in the classroom, they should be asked to rate only the child's academic abilities, and to not include any other behaviors, such as attention and work ethic, into the ratings. Finally, teachers in each of the core academic subjects tested by the WJ-R should be asked to rate the child, rating them only on the subject that they teach. Then, objective and subjective measures can be compared for each child in individual subject areas.

To accurately determine the extent that the label of epilepsy influences a teacher's perceptions of a child, a study could be conducted in which children are randomly assigned the label of epilepsy and the teacher is then told of this label. The sample of children should be all healthy children without other medical or psychiatric diagnoses, to fully maximize that the label of epilepsy alone is driving the teacher's perception. Before giving the teacher the label, they should be asked to rate the child academically, and then, the teacher should be given the label and again asked to rate the child after having them in their classroom for at least 3 months. This would determine the extent to which the label has influenced the teacher's ratings of the child. The teacher's perception of epilepsy might alter their behavior toward the child, and possibly cause the child to internalize these perceptions. The child's perception of their own epilepsy and perceptions related to the teacher might influence their academic performance as well. Children with epilepsy should be assessed for the perceptions they receive from their teacher about epilepsy and also be assessed for their self-concept and self-esteem in academic situations.

Teachers might have a negative perception of the academic abilities of children with epilepsy. The perception of the label of epilepsy might influence how a teacher rates the academic performance of a child and how the child is treated in the classroom. These perceptions could have significant effects on the child psychosocially and academically. Further research in this area needs to be completed to fully determine the extent to which teachers have a negative perception of epilepsy and the ways that these children are affected by these perceptions and how these perceptions can be overcome.

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Figure 1.

Academic Achievement Standard Scores (+/- 1 SEM) after Correcting for IQ and for How Well Teacher Knows the Child, Graphed by Epilepsy Label (Labeled as grey, Unlabeled as white) and by Source (WJR or TRF).

Corrected scores were adjusted for covariates (IQ and how well the teacher knew the child) and were converted to a common metric (standard scores; M=100, SD=15) for ease of comparison.

Table 1
Demographic, Clinical, Academic, and Dependent Variables for the Entire Sample and Label Groups.

	Total N=125		Labeled n = 92		Unlabeled n = 33		Group Comparisons	
Variables	M	SD	M	SD	M	SD	T or χ^2	p
Demographic and Clinical Characteristics								
Age	11.9	1.9	11.8	1.8	12.4	2.0	1.6	0.11
IQ	93.4	15.5	91.7	14.2	98.4	15.1	2.3	0.02
Current Grade	6.0	2.0	5.8	1.9	6.6	2.2	1.8	0.07
% Female	49.6		53.1		38.9		3.1	0.08
% Caucasian	92.0		93.9		88.9		4.9	0.18
% Left-handed	16.0		15.0		19.4		0.9	0.34
% Monotherapy	80.8		80.0		83.8		0.7	0.70
% Who Had Repeated a Grade	13.6		16.3		6.1		1.0	0.35
% In Special Education Services	68.8		73.9		54.5		4.2	0.09
% Diagnosis of Learning Disability	26.4		29.3		18.8		4.0	0.05
How Long Teacher Had Known Child (mos)	16.5	13.7	17.7	14.1	12.6	13.3	-1.8	0.07
How Well Teacher Knew Child	2.4	0.5	2.4	0.6	2.2	0.5	-1.9	0.05
Teacher Class Time With Child (hrs)	3.6	2.5	3.4	2.4	3.7	2.7	0.5	0.62
Age at Onset	6.5	3.8	6.2	3.9	7.4	3.6	1.6	0.11
Number of Seizure Types	1.7	0.8	1.8	0.8	1.6	0.8	-1.6	0.11
Seizure Control (%)								
Controlled	29.2		27.0		52.8		2.8	0.09
Active	67.3		73.0		41.7		2.8	0.09
Unknown	3.5		0.0		5.5		2.8	0.09
Seizure Type (%)								
Partial	62.4		66.6		50.0		7.9	0.24
Generalized	37.6		33.4		50.0		7.9	0.24
Epileptic Syndrome (%)								
Localization-Related								
Idiopathic	8.0		5.4		15.2		7.4	0.12
Symptomatic/	53.6		59.8		36.4			
Cryptogenic								
Generalized								
Idiopathic	33.6		30.4		42.4			
Symptomatic/	0.8		1.1		0.0			
Cryptogenic								
Unclassified	4.8		3.3		6.0			
Dependent Variables - Uncorrected Scores								
Child Scores								
WJ-R Broad Reading	93.3	16.9	91.7	16.8	97.2	15.2	1.6	0.10
Age SS ¹								
WJ-R Broad Math	93.5	20.2	91.0	20.2	99.3	21.2	2.0	0.06
SS ¹								
WJ-R Broad Writing	84.4	16.6	83.1	15.2	88.4	16.3	1.7	0.10
Age SS ¹								
WJ-R Broad Ach. SS	90.2	16.5	88.5	16.3	94.9	16.5	1.9	0.06
Overall ¹								
Teacher Scores								
TRF Academic	44.3	9.1	42.8	8.8	48.5	8.5	3.2	0.002
Performance (T-score)								
Dependent Variables - Corrected Scores ²								
Child Scores								
WJ-R Broad Ach. Score			100.4	7.6	99.94	7.8		
Overall (Corrected SS) ²								
Teacher Scores								
TRF Academic			98.3	12.2	102.5	12.5	4.22 ³	0.04 ³
Performance (Corrected SS) ²								

Note. TRF = Achenbach Teacher Report Form, WJ-R = Woodcock-Johnson Tests of Achievement

¹ Age SS = Age-Adjusted Standard Score (M=100, SD=15)

² Corrected scores were adjusted for covariates (IQ and how well the teacher knew the child) and were converted to a common metric (standard scores; M=100, SD=15) for ease of comparison.

³ F associated with the Source x Label interaction adjusting for covariates (IQ and how well the teacher knew the child)